

claims 26 or 28 of U.S. Patent No. 6,067,077. The double patenting rejection is rendered moot in light of the present amendment.

Allowable Subject Matter

The Applicants gratefully appreciate the indication of allowable subject matter in claims 53 and 67.

Claim Rejections Under 35 U.S.C. 103

Claims 45-52 and 54-66 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,790,108 to Salcudean et al. ("the Salcudean patent"), U.S. Patent No. 5,116,180 to Fung et al. ("the Fung patent") and U.S. Patent No. 5,223,776 to Radke et al. ("the Radke patent").

The Salcudean patent discloses a mouse controller having a tactile feedback device. The Salcudean patent discloses coils and magnets arranged to measure the force input by the user and modify the amount of force exerted on the user. As noted by the examiner, the Salcudean patent is silent with respect to filtering the output of the force feedback sensors to reduce any disturbances caused by the movement of the mouse in response to the force feedback. Indeed, the Salcudean patent fails disclose any kind of filter on the output for any reason.

The Fung patent discloses a hand controller that controls a robotic arm. The Fung patent also discloses filtering the signals from the sensors located with the robotic arm. The noise filter of the Fung patent is intended to filter the mechanical noise generated by the movement of the robotic arm. Signals output from the hand controller are not filtered (col 6 line 30 – col 7 line 8).

The Radke patent discloses a force-feedback device for controlling a system, specifically a spacecraft or aircraft (col 1 lines 5-8). The Radke patent uses a control system that includes a

filtering function (Fig. 2). Like the Fung patent, the Radke patent does not disclose a filter that filters signals output from the controller.

Claims 45-56

The invention as recited by independent claim 45 includes “filtering the input data.” The Salcudean patent fails to disclose a filtering step. Moreover, the Salcudean patent fails to disclose “filtering of the input data operative to reduce visual disturbance in the associated graphical environment.” The Salcudean patent fails to disclose a filter that performs any filtering function for any reason.

The invention as recited by independent claim 45 also includes “filtering input data...based on the haptic-feedback signal.” As discussed above, the Salcudean patent fails to disclose a filtering step. Moreover, the Salcudean, Fung and Radke patents fail to disclose filtering input data based on a haptic-feedback signal. None of the cited references, either alone or in combination, disclose “filtering input data,” where the input data is based on a haptic-feedback signal and “the filtering of the input data is operative to reduce visual disturbance in the associated graphical environment.” For at least these reasons, independent claim 45 is allowable over the cited references.

Dependent claims 46-52 and 54-56 are allowable at least due to their dependence upon independent claim 45.

Claims 57 and 59-64

The invention as recited by independent claim 57 includes “filtering the input data.” As discussed above, the Salcudean patent fails to disclose a filtering step or a filtering step performing a specific function.

The invention as recited by independent claim 57 also includes “filtering input data according to a disturbance filter process associated with the haptic feedback to provide filtered input data, the input data being output by the haptic-feedback device during the output of the haptic feedback and being based on movement of the haptic-feedback device, the filtering of the input data operative to reduce disturbance in an associated displayed graphical environment caused by the output of the haptic feedback.” As discussed above, the Salcudean patent fails to disclose a filtering step. Moreover, the Salcudean, Fung and Radke patents fail to disclose “filtering input data” or filtering input data “operative to reduce disturbance in an associated graphical environment caused by the output of the haptic feedback.” None of the references, either alone or in combination, disclose filtering input data to reduce disturbance in an associated graphical environment caused by haptic feedback. For at least these reasons, claim 57 is allowable over the cited references.

Dependent claims 59-64 are allowable at least due to their dependence upon independent claim 57.

Claims 65-68

The invention as recited by independent claim 65 includes “a filter configured to receive input data from the sensor and to provide filtered input data to an associated graphical display environment, the input data being based on the haptic-feedback signal.” As discussed above, the Salcudean patent fails to disclose a filtering step and the Salcudean, Fung and Radke patents do not disclose “filtering input data” or filtering input data “to provide filtered input data to an associated graphical display environment, the input data being based on the haptic-feedback signal.” None of the references, either alone or in combination, disclose filtering input data to an

associated graphical environment based on a haptic feedback signal. For at least these reasons, independent claim 65 is allowable over the cited references.

Dependent claims 66, 67 and 68 are allowable at least due to their dependence upon independent claim 65.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

COOLEY GODWARD LLP

Date: December 9, 2002

By: 

Erik B. Milch
Reg. No. 42,887

COOLEY GODWARD LLP
11951 Freedom Drive
Reston Town Center
Reston, Virginia 20190-5656
(703) 456-8000 – Phone
(703) 456-8100 - Facsimile

Enclosure: Appendix indicating claim amendments

Claim Amendments

45. (Once amended) A ~~method for reducing visual disturbances in a graphical environment caused by input data received from a force feedback device, said graphical environment implemented by a computer in communication with said force feedback device, said force feedback device including a user manipulatable object manipulatable by a user, the method comprising:~~

enabling an output of a force sensation from said force receiving a haptic-feedback signal at a haptic-feedback device, the haptic-feedback device being configured to provide input data to an associated graphical environment; and

enabling a filtering of said input data according to a disturbance filter process to provide filtered input data, said input data being received from at least one sensor of said force feedback device during said output of said force sensation and being representative of movement of said user manipulatable object in at least one degree of freedom, wherein said filtering of said data based on the haptic-feedback signal to produce the input data reduces said operative to reduce visual disturbance in said the associated graphical environment caused by said output of said force sensation.

46. (Once amended) A ~~The method as recited in~~ claim 45, wherein at least part of ~~said filtered~~ the input data is used to ~~update a displayed~~ with the associated graphical environment.

47. (Once amended) A ~~The method as recited in~~ claim 46 wherein 45, further comprising determining a position of a graphical object in ~~said the associated~~ graphical environment is ~~updated using said filtered~~ based on the input data.

48. (Once amended) A ~~The method as recited in~~ claim 45, further comprising ~~enabling a report of said filtered~~ communicating the input data to ~~said a~~ computer.

49. (Once amended) ~~A~~The method as ~~recited in~~of claim 46 wherein ~~said enabling an output of a force sensation~~45, further comprising outputting haptic feedback based on the haptic-feedback signal, the outputting haptic feedback and said enabling athe filtering of ~~said input~~the ~~sensor data is performed by~~being accomplished with a processor local to ~~said force feedback device and separate from said computer in communication with said force~~ the haptic-feedback device.

50. (Once amended) ~~A~~The method as ~~recited in~~of claim 46 wherein ~~said enabling an output of a force sensation~~45, further comprising outputting haptic feedback based on the haptic-feedback signal, the outputting haptic feedback and said enabling athe filtering of ~~the input~~sensor data ~~is being performed~~accomplished by a driver ~~running on said computer~~ configured to control the associated graphical environment, the computer configured to be in communication with said force the haptic-feedback device.

51. (Once amended) ~~A~~The method as ~~recited in~~of claim 4545, wherein ~~said disturbance filter process can be enabled or disabled, and wherein said filtering is performed~~the sensor data includes filtering the sensor data only when if ~~said associated disturbance filter~~a filtering process is enabled.

52. (Once amended) ~~A~~The method as ~~recited in~~of claim 4545, wherein ~~said force sensation is output by at least one actuator of said force~~the outputting haptic feedback device, and wherein ~~said output of said force sensation is~~ configured to be correlated with data values associated with an event in saidthe associated graphical environment implemented by said computer in communication with said force feedback device.

53. (Once amended) ~~A~~The method as ~~recited in~~of claim 4545, wherein ~~said disturbance filter process modifies said input~~selectively filtering the sensor data includes filtering the sensor data only when an associated force sensation is output by said force the haptic-feedback devicesignal causes the outputting of the haptic feedback.

54. (Once amended) ~~A~~The method as ~~recited in~~of claim 4546, wherein said disturbance filter process modifies said input selectively filtering includes modifying the sensor data by sampling said the input sensor data over time according to a sampling rate, and using only said sampled input data as said filtered input data.

55. (Once amended) ~~A~~The method as ~~recited in~~of claim 4545, wherein said disturbance filter process modifies said input selectively filtering includes modifying the sensor data by time-averaging said the input sensor data and reporting said using said time-averaged data as said to create filtered input data.

56. (Once amended) ~~A~~The method as ~~recited in~~of claim 4545, wherein said disturbance filter process modifies said input selectively filtering includes modifying the sensor data to produce a held data value by sampling and holding a data value derived from said the input sensor data before said force sensation is based on a movement of the haptic-feedback device without output of haptic feedback, wherein said the input data includes the held data value is used as said filtered input data.

57. (Once amended) A method, comprising:

receiving a haptic-feedback signal at a haptic feedback device;

outputting haptic-feedback based on the haptic feedback signal;

filtering said sensor data to produce input data according to a disturbance filter process associated with a force sensation to provide filtered input data the haptic feedback, said the input sensor data being received from at least one sensor based on a movement of a force the haptic-feedback device during output the outputting of said force sensation by said force the haptic feedback device and being representative of movement of a user-manipulatable object of said force feedback device in at least one degree of freedom, wherein said the filtering of said the input data reduces a operative to reduce disturbance in said an displayed associated graphical environment caused by said the output of said force sensation on said user-manipulatable object the haptic feedback; and

~~providing said filtered input data to be used to update said displayed~~ updating the associated graphical environment based on the input data.

58. ~~() A method as recited in claim 57 further comprising causing said output of said force sensation from said force feedback device.~~

59. ~~(Once amended) An apparatus as recited in~~ The method of claim 57, wherein ~~said the~~ the filtering is ~~performed by~~ includes a driver running on ~~said a~~ a computer configured to be in communication with ~~said force the haptic~~ the haptic feedback device.

60. ~~(Once amended) A~~ The method as ~~recited in of~~ claim 57, wherein ~~said the~~ the disturbance filter process ~~modifies said input~~ includes modifying the sensor data by sampling ~~said the input sensor~~ the sensor data over time according to a sampling rate, and ~~using only said sampled input data as said filtered input data.~~

61. ~~(Once amended) A~~ The method as ~~recited in of~~ claim 57, wherein ~~said the~~ the disturbance filter process ~~modifies said input~~ includes modifying the sensor data by time-averaging ~~said input data and reporting said using said time averaged data as said filtered input the sensor~~ the sensor data.

62. ~~(Once amended) A~~ The method as ~~recited in of~~ claim 57, wherein at least part of ~~said filtered input the disturbance filter process includes filtering the sensor data if the disturbance filter process is used to update a displayed graphical environment enabled.~~

63. ~~(Once amended) A~~ The method as ~~recited in of~~ claim 57 ~~wherein 57, further comprising~~ updating a position of a graphical object in ~~said the associated~~ the associated graphical environment ~~is updated using said filtered based on the input data.~~

64. ~~(Once amended) A~~ The method as ~~recited in of~~ claim 57, wherein ~~said output of said force sensation the outputting the haptic feedback is configured to be correlated with data values~~

associated with an event in said~~the associated~~ graphical environment ~~implemented by said~~ computer.

65. (Once amended) An apparatus ~~for reducing visual disturbances in a graphical environment caused by input data received from a force feedback device, said force feedback device including a user-manipulatable object manipulatable by a user, the apparatus comprising:~~

means for enabling

an output of a force sensation from a force actuator configured to receive a haptic-feedback device signal, the actuator configured to produce haptic feedback based on the haptic feedback signal; and

means for enabling

a filtering of said input data according to a disturbance filter process to provide filtered input data, ~~said input data being received from at least one sensor of said force feedback device during said output of said force sensation~~coupled to the actuator, the sensor configured to detect a movement of the sensor; and being representative of movement of said user-manipulatable object in at least one degree of freedom, wherein said filtering of said input data reduces said visual disturbance in said

a filter configured to receive sensor data from the sensor and to provide input data to an associated graphical environment caused by said output of said force sensation~~based on the haptic-feedback signal.~~

66. (Once amended) An ~~The~~ apparatus as recited in claim 65~~65~~, wherein ~~said means for enabling a filtering receives~~the sensor is configured to receive a command from a host computer in communication with ~~said force feedback device~~the sensor to activate ~~said associated disturbance~~the filter process.

67. (Once amended) An ~~The~~ apparatus as recited in claim 65~~65~~, wherein a plurality of disturbance filter processes are stored in a memory, and wherein ~~said force sensation~~the actuator is configured to output one of a plurality of different available force sensations that may be

~~output by said force haptic-feedback device, wherein at least two of said force sensations are associated with different ones of said disturbance filter processes.~~

154893 v1/RE
3B\$!01!.DOC